

REMARKS

This Application has been carefully reviewed in light of the first Office Action mailed June 6, 2005 (the "Office Action"). In the Office Action, Claims 1-21 are pending. The Examiner rejects Claims 1-21. Applicants amend Claims 1, 10, 20, and 21. As described below, Applicants believe all claims to be allowable over the cited references. Therefore, Applicants respectfully request reconsideration and full allowance of all pending claims.

Claim Rejections – 35 U.S.C. §103

The Examiner rejects Claims 1-21 under 35 U.S.C. § 103(a) as being unpatentable over Christoph Borel, "Iterative Retrieval of Surface Emissivity and Temperature for a Hyperspectral Sensor" ("*Borel*"), in view of Mansoor Khan et al., "Noncontact temperature measurement. II. Least squares based techniques" ("*Khan*"), and in further view of Alan Gillespie, et al., "A Temperature and Emissivity Separation Algorithm for Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) Images," ("*Gillespie*"). Applicants respectfully traverse this rejection of Claims 1-21 and request reconsideration and favorable action.

Independent Claim 1 of the present application, as amended, recites:

A method for estimating an error statistic for retrieved temperature and emissivity of a surface material, comprising:
determining a second order analytical error propagation for a surface temperature and a surface emissivity of a surface material;
retrieving the surface temperature and the surface emissivity from a sufficiently large ensemble of radiance spectra by Monte Carlo simulation; and
determining an error statistic in the retrieved surface temperature and the retrieved surface emissivity arising from random instrument noise, the error statistic being based at least in part on a selected one of the second order analytical error propagation or the Monte Carlo simulation, the selection based on a noise level.

Applicants respectfully submit that the proposed *Borel-Khan-Gillespie* combination does not disclose, teach, or suggest each and every element of Applicants' Claim 1. In the Office Action, the Examiner relies on *Borel* for disclosure of second order analytical error

propagation, *Khan* for disclosure of error correction, and *Gillespie* for disclosure of Monte Carlo simulation. (Office Action, page 3). While each of the cited references may generally disclose the concepts listed above, none of the cited references, whether considered individually or in combination, disclose, teach, or suggest “determining an error statistic in the retrieved surface temperature and the retrieved surface emissivity arising from random instrument noise, the error statistic being based at least in part on a selected one of the second order analytical error propagation or the Monte Carlo simulation, the selection based on a noise level,” as recited in Applicants’ Claim 1. As acknowledged by the Examiner, *Borel* “does not disclose the error corrections.” (Office Action, page 3). While *Kahn* discloses error correction, the error correction performed is by *Kahn* “through the use of least squares curve fitting techniques.” (*Kahn*, Abstract). Finally, *Gillespie* only discloses performing “a Monte Carlo experiment . . . 30 times, such that the ‘measured’ radiances are affected by different amounts of measurement ‘noise.’” (*Gillespie*, page 1122). Accordingly, the proposed *Borel-Khan-Gillespie* combination cannot be said to disclose, teach, or suggest “determining an error statistic in the retrieved surface temperature and the retrieved surface emissivity arising from random instrument noise, the error statistic being based at least in part on a selected one of the second order analytical error propagation or the Monte Carlo simulation, the selection based on a noise level,” as recited in Applicants’ Claim 1.

For at least these reasons, Applicants respectfully request reconsideration and allowance of Claim 1.

Independent Claims 10, 20, and 21 recite certain limitations that are analogous to the features discussed above with regard to Claim 1. For example, Claim 10 recites “a processing device operable to estimate an error statistic in the received surface temperature and the received surface emissivity arising from random instrument noise, the estimated error statistic being based at least in part on a selected one of a second-order analytical propagation or a Monte Carlo simulation, the selection based on a noise level.” As another example, Claim 20 recites “means for estimating an error statistic in the received surface temperature and the received surface emissivity arising from random instrument noise, the estimated error statistic being based at least in part on a selected one of a second-order analytical propagation or a Monte Carlo simulation, the selection based on a noise level.” Claim 21 recites a “computer readable medium comprising a program operable, when executed on the

processor, to . . . estimate an error statistic in the received surface temperature and the received surface emissivity arising from random instrument noise, the estimated error statistic being based at least in part on a selected one of a second-order analytical propagation or a Monte Carlo simulation, the selection based on a noise level.” Accordingly, for reasons similar to those discussed above with regard to Claim 1, Applicants respectfully submit that that Claims 10, 20, and 21 are allowable over the proposed *Borel-Khan-Gillespie* combination.

For at least these reasons, Applicants respectfully request reconsideration and allowance of Claims 10, 20, and 21.

Claims 2-9 and 14-19 are patentable at least because they depend on Claims 1 and 10 respectively, which Applicants have shown above to be allowable. Additionally, Applicants note that the Office Action does not include explicit rejections of dependent Claims 2-9 and 11-13, 15-16, and 18-19. Specifically, the Examiner has not indicated where in the proposed *Borel-Khan-Gillespie* combination the features recited in dependent Claims 2-9 and 11-13, 15-16, and 18-19 may be found. The Examiner’s rejection of Claims 2-9 and 11-13, 15-16, and 18-19 provides Applicants with no understanding of the Examiner’s rationale for applying the disclosures of *Borel*, *Khan*, and *Gillespie* to Applicants’ claimed invention. For this reason, Applicants respectfully submit that the Examiner has failed to cite the references properly and with sufficient specificity under 37 C.F.R. § 1.104 to allow Applicants to adequately respond to the rejections. That section states:

In rejecting claims for want of novelty or obviousness, the examiner must cite the best references at his or her command. When a reference is complex or shows or describes inventions other than that claimed by the applicant, the particular part relied on must be designated as nearly as practicable. The pertinence of each reference, if not apparent, must be clearly explained and each rejected claim specified.

37 C.F.R. § 1.104(c)(2) (emphasis added). As stated above, 37 C.F.R. § 1.104(c)(2) applies to the complexity of the reference and not the complexity of the present application. When a reference is complex or shows or describes inventions other than that claimed by the applicant, the particular part relied on must be designated as nearly as practicable.

Applicants respectfully submit that the cited references are indeed complex within the meaning of 37 C.F.R. § 1.104(c)(2). Thus, 37 C.F.R. § 1.104 requires the Examiner to designate the particular portions of *Borel*, *Khan*, and *Gillespie* relied on by the Examiner. In addition, Applicants submit that *Borel*, *Khan*, and *Gillespie* each describe an invention other than that claimed by Applicants which, under 37 C.F.R. § 1.104(c)(2), also requires relevant portions of the references to be designated. Since the Examiner read *Borel*, *Khan*, and *Gillespie* when making the determination to apply them to Applicants' invention and determined which portions of the references teach Applicants' claimed invention, it should have been simple and practical for the Examiner to note which specific teachings in the cited references are relevant to each element of each of Applicants' claims and why such teachings of the references are relevant. Because the Examiner has not done that, Applicants respectfully submit that the rejection of Claims 2-9 and 11-13, 15-16, and 18-19 is improper.

With regard to Claims 14 and 17, the Examiner acknowledges that “the applied prior art does not expressly disclose that the random noise is no more [than] 1 or 5.” (Office Action, page 5, [*sic*]). In maintaining the rejections, the Examiner speculates that “[i]t would have been an obvious matter of design choice to a person of ordinary skill in the art to use such a ratio because Applicants have not disclosed that the particular number provides an advantage, is used for a particular purpose, or solves a stated problem.” (Office Action, pages 3-4). Applicants disagree and direct the Examiner to pages 19-20 of the Specification of the filed Application.

Furthermore, the M.P.E.P. sets forth the strict legal standard for establishing a *prima facie* case of obviousness based on modification or combination of prior art references. “To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the

prior art reference (or references where combined) must teach or suggest all the claim limitations.” M.P.E.P. § 2142, 2143. The teaching, suggestion or motivation for the modification or combination and the reasonable expectation of success must both be found in the prior art and cannot be based on an Applicants’ disclosure. *See Id.* (citations omitted). “Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art” at the time of the invention. M.P.E.P. § 2143.01. Even the fact that references *can* be modified or combined does not render the resultant modification or combination obvious unless the prior art teaches or suggests the desirability of the modification or combination. *See Id.* (citations omitted).

The governing Federal Circuit case law makes this strict legal standard even more clear.¹ According to the Federal Circuit, “a showing of a suggestion, teaching, or motivation to combine or modify prior art references is an essential component of an obviousness holding.” *In re Sang-Su Lee*, 277 F.3d 1338, 1343, 61 U.S.P.Q.2d 1430, 1433 (Fed. Cir. 2002) (quoting *Brown & Williamson Tobacco Corp. v. Philip Morris Inc.*, 229 F.3d 1120, 1124-25, 56 U.S.P.Q.2d 1456, 1459 (Fed. Cir. 2000)). “Evidence of a suggestion, teaching, or motivation . . . may flow from the prior art references themselves, the knowledge of one of ordinary skill in the art, or, in some cases, the nature of the problem to be solved.” *In re Dembiczak*, 175 F.3d 994, 999, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999). However, the “range of sources available . . . does not diminish the requirement for actual evidence.” *Id.* Even a determination that it would have been obvious to one of ordinary skill in the art at the time of the invention to try the proposed modification or combination is not sufficient to establish a *prima facie* case of obviousness. *See In re Fine*, 837 F.2d 1071, 1075, 5 U.S.P.Q.2d 1596, 1599 (Fed. Cir. 1988).

In addition, the M.P.E.P. and the Federal Circuit repeatedly warn against using an applicants’ disclosure as a blueprint to reconstruct the claimed invention. For example, the M.P.E.P. states, “The tendency to resort to ‘hindsight’ based upon applicant’s disclosure is often difficult to avoid due to the very nature of the examination process. However,

¹ Note M.P.E.P. 2145 X.C. (“The Federal Circuit has produced a number of decisions overturning obviousness rejections due to a lack of suggestion in the prior art of the desirability of combining references.”).

impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art.” M.P.E.P. § 2142. The governing Federal Circuit cases are equally clear. “A critical step in analyzing the patentability of claims pursuant to [35 U.S.C. § 103] is casting the mind back to the time of invention, to consider the thinking of one of ordinary skill in the art, guided only by the prior art references and the then-accepted wisdom in the field. . . . Close adherence to this methodology is especially important in cases where the very ease with which the invention can be understood may prompt one ‘to fall victim to the insidious effect of a hindsight syndrome wherein that which only the invention taught is used against its teacher.’” *In re Kotzab*, 217 F.3d 1365, 1369, 55 U.S.P.Q.2d 1313, 1316 (Fed. Cir. 2000) (citations omitted). In *In re Kotzab*, the Federal Circuit noted that to prevent the use of hindsight based on the invention to defeat patentability of the invention, the court requires the Examiner to show a motivation to combine the references that create the case of obviousness. *See id.* *See also, e.g., Grain Processing Corp. v. American Maize-Products*, 840 F.2d 902, 907, 5 U.S.P.Q.2d 1788, 1792 (Fed. Cir. 1988). Similarly, in *In re Dembiczak*, the Federal Circuit reversed a finding of obviousness by the Board, explaining that the required evidence of such a teaching, suggestion, or motivation is essential to avoid impermissible hindsight reconstruction of an applicants’ invention:

Our case law makes clear that the best defense against the subtle but powerful attraction of hind-sight obviousness analysis is *rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references*. Combining prior art references without evidence of such a suggestion, teaching, or motivation simply takes the inventor’s disclosure as a blueprint for piecing together the prior art to defeat patentability—the essence of hindsight.

175 F.3d at 999, 50 U.S.P.Q.2d at 1617 (emphasis added) (citations omitted).

As discussed above, the Examiner acknowledges in the Office Action that “the applied prior art does not expressly disclose that the random noise is no more [than] 1 or 5.” (Office Action, page 3, [*sic*]). In maintaining the rejection, the Examiner speculates that “one of ordinary skill in the art . . . would have expected Applicant’s invention to perform equally well with such a number because the choice of scaling depends on the particular problem to be solved and such a scaling would not affect the design disclosed in [*Borel*].” (Office Action, page 4, [*sic*]). Applicants hereby submit that the random instrument noise

limitations of 1 and 5 $\mu\text{W}/\text{cm}^2\text{-sr-}\mu\text{m}$ are not within the realm of "an obvious design choice," and also challenge the Examiner's statement that the limitations of Claims 14 and 17 would have been an obvious matter of design choice. Such a reasoning, without evidentiary support, is analogous to a reliance on common knowledge. However, M.P.E.P. § 2144.03 specifically states that "it is **never** appropriate to rely solely on 'common knowledge' in the art without evidentiary support in the record, as the principal evidence upon which a rejection was based." [emphasis added] Because Claims 14 and 17 are rejected based only on this assertion of common knowledge, which is the principal evidence upon which the rejections are based, the rejections of Claims 14 and 17 are clearly improper. Thus, Claims 14 and 17 are allowable.

If the Examiner continues to maintain his rejection of Claims 14 and 17 based on this reasoning, then Applicants hereby request the Examiner to provide documentary evidence in the next Office Action, as stated in Section 2144.03(C) of M.P.E.P. Further, if the Examiner is relying on personal knowledge to support the finding of what is known in the art, Applicants hereby request that the Examiner provide an affidavit or declaration setting forth specific factual statements and explanation to support the finding. (See Section 2144.03(C)-M.P.E.P.).

For at least these reasons, Applicants respectfully request reconsideration and allowance of dependent Claims 2-9 and 14-19.

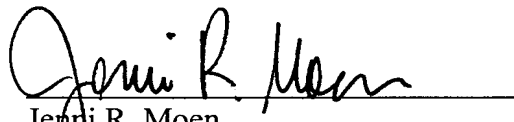
CONCLUSION

Applicants have made an earnest attempt to place this case in condition for allowance. For the foregoing reasons, and for other reasons clearly apparent, Applicants respectfully request full allowance of all pending Claims.

Applicants believe no fees are due. However, the Commissioner is hereby authorized to charge any fee or credit any overpayment to Deposit Account No. 02-0384 of Baker Botts L.L.P.

If there are matters that can be discussed by telephone to advance prosecution of this application, Applicants invite the Examiner to contact its attorney at the number provided below.

Respectfully submitted,
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